We claim:

1. An implantable medical device comprising:

a housing;

an electronics module disposed within the housing;

an energy source disposed within the housing and electrically coupled to the electronics module; and

an electrolytic capacitor disposed within the housing and electrically coupled to the electronics module, the capacitor further comprising:

a capacitor case defining an interior case chamber, the case having a base having a base peripheral edge, a case side wall extending between the base peripheral edge through a side wall height to a side wall opening edge, and a case chamber periphery having a major portion and a minor portion bounded by an interior surface of said case side wall;

a cover hermetically sealed against the side wall opening edge to enclose the interior case chamber; and

an electrode stack assembly located within the interior case chamber, the electrode stack assembly having a stack height and a stack periphery consisting of a major periphery length and a minor periphery length, the stack periphery through the major periphery length configured in shape to the shape of the major portion of the case chamber periphery and further comprising a plurality of capacitor layers stacked in registration upon one another and between the case base and the cover, each capacitor layer comprising:

an anode sub-assembly comprising at least one anode layer having an anode peripheral edge disposed at a first distance from the case side wall interior surface throughout the major portion of said case chamber periphery, the anode layer having an anode tab extending toward the case side wall in the minor portion of said case chamber periphery;

a cathode layer having a cathode peripheral edge disposed at a second distance from the case side wall interior surface throughout the major portion of the case chamber periphery, the second distance greater than the first distance, the cathode layer having a cathode tab extending toward the case side wall in the minor portion of said case chamber periphery; and

a plurality of electrolyte bearing separator layers each having a separator peripheral edge extending toward the case side wall, certain of the separator layers disposed between each adjacent anode sub-assembly and cathode layer of each capacitor layer and others of the separator layers disposed between anode sub-assemblies and cathode layers of adjoining capacitor layers of the electrode stack assembly;

whereby the anode layers of the anode sub-assemblies of the stacked capacitor layers extend closer to the case side wall than the cathode layers of the capacitor layers throughout the major portion of the case chamber periphery such that the tendency of any anode layer edges to extend toward an adjacent cathode layer in the stack height direction causes the anode layer edges having such tendency to contact an adjacent anode layer.

2. The implantable medical device of Claim 1, wherein the capacitor further comprises a case liner having a liner side wall disposed around said stack periphery, said case liner formed of an electrically insulating material for electrically insulating said anode peripheral edges of said anode sub-assemblies from said case side wall interior surface.

3. The implantable medical device of Claim 2, wherein said first distance is in the range of about 0.015 to 0.040 inches, and said second distance is in the range of about 0.030 to 0.040 inches.

4. The implantable medical device of Claim 3, wherein the separator layer peripheral edges bear against the case liner side wall throughout the major portion of the case chamber periphery.

5. The implantable medical device of Claim 1, wherein said first distance is in the range of about 0.015 to 0.040 inches, and said second distance is in the range of about 0.030 to 0.040 inches.

6. The implantable medical device of Claim 5, wherein the separator layer peripheral edges extend through the first and second distances to the case side wall interior surface throughout the major portion of the case chamber periphery.

7. The implantable medical device of Claim 1, wherein the separator layer peripheral edges extend through the first and second distances to the case side wall interior surface throughout the major portion of the case chamber periphery.

8. An electrolytic capacitor comprising:

a capacitor case defining an interior case chamber, the case having a base having a base peripheral edge, a case side wall extending between the base peripheral edge through a side wall height to a side wall opening edge, and a case chamber periphery having a major portion and a minor portion bounded by an interior surface of said case side wall;

a cover hermetically sealed against the side wall opening edge to enclose the interior case chamber; and

an electrode stack assembly located within the interior case chamber, the electrode stack assembly having a stack height and a stack periphery consisting of a major periphery length and a minor periphery length, the stack periphery through the major periphery length configured in shape to the shape of the major portion of the case chamber periphery and further comprising a plurality of capacitor layers stacked in registration upon one another and between the case base and the cover, each capacitor layer comprising:

an anode sub-assembly comprising at least one anode layer having an anode peripheral edge disposed at a first distance from the case side wall interior surface throughout the major portion of said case chamber periphery, the anode layer having an

anode tab extending toward the case side wall in the minor portion of said case chamber periphery;

a cathode layer having a cathode peripheral edge disposed at a second distance from the case side wall interior surface throughout the major portion of the case chamber periphery, the second distance greater than the first distance, the cathode layer having a cathode tab extending toward the case side wall in the minor portion of said case chamber periphery; and

a plurality of electrolyte bearing separator layers each having a separator peripheral edge extending toward the case side wall, certain of the separator layers disposed between each adjacent anode sub-assembly and cathode layer of each capacitor layer and others of the separator layers disposed between anode sub-assemblies and cathode layers of adjoining capacitor layers of the electrode stack assembly;

whereby the anode layers of the anode sub-assemblies of the stacked capacitor layers extend closer to the case side wall than the cathode layers of the capacitor layers throughout the major portion of the case chamber periphery such that the tendency of any anode layer edges to extend toward an adjacent cathode layer in the stack height direction causes the anode layer edges having such tendency to contact an adjacent anode layer.

9. The capacitor of Claim 8, further comprising a case liner having a liner side wall disposed around said stack periphery, said case liner formed of an electrically insulating material for electrically insulating said anode peripheral edges of said anode sub-assemblies from said case side wall interior surface.

10. The capacitor of Claim 9, wherein said first distance is in the range of about 0.015 to 0.040 inches, and said second distance is in the range of about 0.030 to 0.040 inches.

11. The capacitor of Claim 10, wherein the separator layer peripheral edges bear against the case liner side wall throughout the major portion of the case chamber periphery.

12. The capacitor of Claim 8, wherein said first distance is in the range of about 0.015 to 0.040 inches, and said second distance is in the range of about 0.030 to 0.040 inches.

13. The capacitor of Claim 12, wherein the separator layer peripheral edges extend through the first and second distances to the case side wall interior surface throughout the major portion of the case chamber periphery.

14. The capacitor of Claim 8, wherein the separator layer peripheral edges extend through the first and second distances to the case side wall interior surface throughout the major portion of the case chamber periphery.

15. A method of assembling an implantable medical device comprising:

providing a housing;

disposing an electronics module within the housing;

disposing an energy source within the housing;

electrically coupling the energy source to the electronics module;

forming an electrolytic capacitor through:

forming a capacitor case defining an interior case chamber, the case having a base having a base peripheral edge, a case side wall extending between the base peripheral edge through a side wall height to a side wall opening edge, and a case chamber periphery having a major portion and a minor portion bounded by an interior surface of said case side wall;

providing a cover adapted to be hermetically sealed against the side wall opening edge to enclose the interior case chamber after an electrode stack is disposed therein; and

forming an electrode stack assembly from a plurality of capacitor layers stacked in registration upon one another and between the case base and the cover through a stack height adapted to be fitted within the interior case chamber, the electrode stack assembly having a stack periphery consisting of a major periphery length and a minor periphery length, the stack periphery through the major periphery length configured in shape to the

shape of the major portion of the case chamber periphery, the formation of each capacitor layer further comprising:

forming an anode sub-assembly comprising at least one anode layer with an anode peripheral edge shaped to be disposed at a first distance from the case side wall interior surface throughout the major portion of said case chamber periphery when fitted into the interior case chamber, the anode layer having an anode tab extending toward the case side wall in the minor portion of said case chamber periphery when fitted into the interior case chamber;

forming a cathode layer having a cathode peripheral edge shaped to be disposed at a second distance from the case side wall interior surface throughout the major portion of the case chamber periphery, the second distance greater than the first distance, when fitted into the interior case chamber, the cathode layer having a cathode tab extending toward the case side wall in the minor portion of said case chamber periphery when fitted into the interior case chamber; and

providing a plurality of electrolyte bearing separator layers each having a separator peripheral edge extending toward the case side wall when fitted into the case chamber; and

stacking the anode sub-assembly and the cathode layer in registration with certain of the separator layers disposed between the anode sub-assembly and the cathode layer and others of the separator layers disposed upon the other surfaces of the anode sub-assembly and the cathode layer, whereby the cathode layer peripheral edge is disposed inward of the anode sub-assembly peripheral edge by a third distance throughout the major periphery length;

stacking a plurality of the capacitor layers and further separator layers within the interior case chamber such that the adjacent anode and cathode layers are electrically isolated from one another and the anode peripheral edges of the anode sub-assemblies of the stacked capacitor layers extend closer to the case side wall than the cathode peripheral edges of the cathode layers of the stack of capacitor layers throughout the major portion of the case chamber periphery such that the tendency of any anode layer

edges to extend toward an adjacent cathode layer causes the anode layer edges having such tendency to contact an adjacent anode layer;

forming an electrical connector assembly with the cathode layer tabs and the anode layer tabs;

hermetically sealing the case cover to the side wall opening edge; and

filling the capacitor interior chamber with electrolyte;

disposing the capacitor assembly within the housing; and

electrically coupling the capacitor electrical connector assembly to the electronics module.

16. The method of assembling an implantable medical device of Claim 15, wherein the capacitor forming step further comprises forming a case liner having a liner side wall of an electrically insulating material and disposing the case liner side wall around the stack periphery for electrically insulating said anode peripheral edges of said anode sub-assemblies from said case side wall interior surface.

17. The method of assembling an implantable medical device of Claim 16, wherein said first distance is in the range of about 0.015 to 0.040 inches, and said second distance is in the range of about 0.030 to 0.040 inches.

18. The method of assembling an implantable medical device of Claim 17, wherein the separator layer peripheral edges bear against the case liner side wall throughout the major portion of the case chamber periphery.

19. The method of assembling an implantable medical device of Claim 15, wherein said first distance is in the range of about 0.015 to 0.040 inches, and said second distance is in the range of about 0.030 to 0.040 inches.

20. The method of assembling an implantable medical device of Claim 19, wherein the separator layer peripheral edges extend through the first and second distances to the case side wall interior surface throughout the major portion of the case chamber periphery.

21. The method of assembling an implantable medical device of Claim 15, wherein the separator layer peripheral edges extend through the first and second distances to the case side wall interior surface throughout the major portion of the case chamber periphery.

22. A method of fabricating an electrolytic capacitor comprising:

forming a capacitor case defining an interior case chamber, the case having a base having a base peripheral edge, a case side wall extending between the base peripheral edge through a side wall height to a side wall opening edge, and a case chamber periphery having a major portion and a minor portion bounded by an interior surface of said case side wall;

providing a cover adapted to be hermetically sealed against the side wall opening edge to enclose the interior case chamber after an electrode stack is disposed therein; and

forming an electrode stack assembly from a plurality of capacitor layers stacked in registration upon one another and between the case base and the cover through a stack height adapted to be fitted within the interior case chamber, the electrode stack assembly having a stack periphery consisting of a major periphery length and a minor periphery length, the stack periphery through the major periphery length configured in shape to the shape of the major portion of the case chamber periphery, the formation of each capacitor layer further comprising:

forming an anode sub-assembly comprising at least one anode layer with an anode peripheral edge shaped to be disposed at a first distance from the case side wall interior surface throughout the major portion of said case chamber periphery when fitted into the interior case chamber, the anode layer having an anode tab extending toward the case side wall in the minor portion of said case chamber periphery when fitted into the interior case chamber;

forming a cathode layer having a cathode peripheral edge shaped to be disposed at a second distance from the case side wall interior surface throughout the major portion of the case chamber periphery, the second distance greater than the first distance, when fitted into the interior case chamber, the cathode layer having a cathode tab extending toward the case side wall in the minor portion of said case chamber periphery when fitted into the interior case chamber; and

providing a plurality of electrolyte bearing separator layers each having a separator peripheral edge extending toward the case side wall when fitted into the case chamber; and

stacking the anode sub-assembly and the cathode layer in registration with certain of the separator layers disposed between the anode sub-assembly and the cathode layer and others of the separator layers disposed upon the other surfaces of the anode sub-assembly and the cathode layer, whereby the cathode layer peripheral edge is disposed inward of the anode sub-assembly peripheral edge by a third distance throughout the major periphery length;

stacking a plurality of the capacitor layers and further separator layers within the interior case chamber such that the adjacent anode and cathode layers are electrically isolated from one another and the anode peripheral edges of the anode sub-assemblies of the stacked capacitor layers extend closer to the case side wall than the cathode peripheral edges of the cathode layers of the stack of capacitor layers throughout the major portion of the case chamber periphery such that the tendency of any anode layer edges to extend toward an adjacent cathode layer causes the anode layer edges having such tendency to contact an adjacent anode layer;

forming an electrical connector assembly with the cathode layer tabs and the anode layer tabs;

hermetically sealing the case cover to the side wall opening edge; and

filling the capacitor interior chamber with electrolyte.

23. The method of Claim 21, further comprising forming a case liner having a liner side wall of an electrically insulating material and disposing the case liner side wall around the stack periphery for electrically insulating said anode peripheral edges of said anode sub-assemblies from said case side wall interior surface.

24. The method of Claim 23, wherein said first distance is in the range of about 0.015 to 0.040 inches, and said second distance is in the range of about 0.030 to 0.040 inches.

25. The method of Claim 24, wherein the separator layer peripheral edges bear against the case liner side wall throughout the major portion of the case chamber periphery.

26. The method of Claim 22, wherein said first distance is in the range of about 0.015 to 0.040 inches, and said second distance is in the range of about 0.030 to 0.040 inches.

27. The method of Claim 26, wherein the separator layer peripheral edges extend through the first and second distances to the case side wall interior surface throughout the major portion of the case chamber periphery.

28. The method of Claim 22, wherein the separator layer peripheral edges extend through the first and second distances to the case side wall interior surface throughout the major portion of the case chamber periphery.

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